

rejections, however, require that a single reference disclose the claimed invention. (*See* MPEP 706.02(a).) Thus, Applicants contend that the Examiner's reliance on disclosure from multiple references defeats the very novelty rejection that the Examiner sought to support. As the rejection of claim 52 fails, so too must the rejection of dependent claims 53 and 54.

Moreover, Applicants contend that the Examiner based the rejections on erroneous assumptions. For instance, in attempting to reject claim 53, the Examiner assumed that Doan discloses layering a barrier using a non-organic precursor. For support, the Examiner cited the portion in Doan, col. 4, ln. 6, that states that Doan's film 40 may be formed by plasma processing. Plasma processing, however, does not necessarily indicate that a non-organic precursor is used. For Example, U.S. Patent No. 4,863,755 by Hess et al. discloses using organosilicon precursors in a plasma process for depositing silicon nitride. (Hess is being cited in an Information Disclosure Statement filed concurrently with this Response.) In attempting to reject claim 54, the Examiner stated that the use of silane is inherent to (presumably Doan's) plasma process. Doan, however, teaches many alternatives to layer 40 that do not incorporate silicon and would therefore not require a silicon precursor such as silane. (Doan at col. 4, ln. 17-27 (mentioning titanium nitride, tantalum nitride, and titanium oxide).) Moreover, even for the layers mentioned in Doan that do incorporate silicon, Hess indicates that there are preferred alternatives to silane in providing silicon-based layers. (Hess at col. 1, ln. 37-44.) Thus, the Examiner is incorrect in assuming that silane plays an inherent part of Doan's process. The incorrect assumptions used to reject the claims provide further support that the Examiner has not met the *prima facie* burden for rejection.

Similarly, in attempting to reject claim 55, the Examiner assumes that Doan discloses layering a carbon-free barrier on a substrate. Nothing in Doan, however, expresses the carbon content of any layer. Further, at least one alternative for Doan's layer 40 – the TEOS layer – will most likely contain carbon, and even Doan's silicon nitride alternative touted by the Examiner may have carbon according to the disclosure of Hess. Because a carbon-free layer is neither expressed nor inherent in Doan, the Examiner's basis for rejecting this claim is erroneous. As the rejection of claim 55 fails, so too must the rejection of dependent claims 56 and 57.

Moreover, because dependent claim 56 expresses an additional limitation concerning claim 55's carbon-free barrier, the Examiner's additional assumptions about Doan's disclosure of

such a layer are also erroneous. As a result, the novelty of claim 56 and its dependent claim 57 is further supported.

## II. Rejection of claims under §103

### A. Rejection of claims based on Doan in combination with Ying

The Examiner rejected claims 58 and 59 as being obvious in light of Doan in combination with Ying (U.S. Patent No. 5,384,288). The Examiner indicated that the arguments raised against claims 55 and 57 apply to these claims as well, adding that one of ordinary skill in the art would be motivated to apply Ying's anneal step. First, Applicants note that the Examiner's arguments against claims 55 and 57 are flawed, as discussed in section I above. Hence, the Examiner's arguments are also inapplicable to dependent claims 58 and 59.

Second, one of ordinary skill in the art would lack motivation to combine these references, and even be encouraged to avoid combining them, because the references teachings conflict on a very fundamental level. Specifically, while both teach methods concerning providing a planarized surface, their methods are completely contradictory. Doan proposes interposing between two layers a film with enough rigidity and structural integrity to prevent the stresses from one layer from affecting the other during a reflow process. (Doan at Abstract; col. 4, ln. 17-27; ln. 44-60.) To do otherwise would allow the layers' differences in coefficients of thermal expansion to cause a buckling effect. (*Id.* at col. 1, ln. 28-40.) Ying, to the contrary, teaches creating, exacerbating, and transmitting stress to layers in order to aid in planarization, the thought being that the stress will lower the temperature at which the layers will reflow. (Ying at col. 4, ln. 10-14; ln. 23-25; 48-50; 65-68.) Applicants contend that one of ordinary skill in the art would be discouraged from even attempting to combine the teachings of references that offer completely contradictory strategies for dealing with the same problem. The only way one could sift through the contradictions and pick and choose the portions that arguably address the claimed invention is by using the benefit of hindsight gained from the disclosure of the application at issue in this Response. Such hindsight is an improper factor in applying the obviousness standard against claims 58 and 59.

B. Rejection of claims based on Doan in combination with Ghezzi

The Examiner rejected claims 60-61 and 63-64 as being obvious in light of Doan in combination with Ghezzi (U.S. Patent No. 5,132,239). Applicants contend that the Examiner has misinterpreted Doan as well as Ghezzi, and that one of ordinary skill in the art would be actively discouraged from combining these references. Concerning the Examiner's misinterpretation of Doan, the Examiner assumed that Doan discloses depositing an insulative material that is less insulative than the underlying barrier. While Doan discloses one material selected from a list of conductive or insulative materials (Doan at col. 3, ln. 50-59) over a second material selected from a list of conductive, semiconductive, and insulative materials (*Id.* at ln. 28-43), there is nothing in Doan specifying the relative insulative qualities of the two layers. Rather, Doan's focus in terms of material selection is that the material maintain its rigidity and structural integrity upon subsequent heating steps. (*Id.* at col. 4, ln. 17-27.)

Concerning the Examiner's misinterpretation of Ghezzi, the Examiner assumed that Ghezzi discloses a conductive element (citing Ghezzi's element 5 in FIG. 3) that is coextensive with an insulating region (citing Ghezzi's element 21 in FIG. 3). Ghezzi's insulation 21, however, extends only from one field oxide region 11 to another. Ghezzi's conductive element 5, on the other hand, not only extends over that area but also extends over multiple field oxide regions 11 as well as over coupling area 12. Hence, Ghezzi's conductive element 5 cannot be described as being coextensive with Ghezzi's insulation 21.

As for the purported motive to combine Doan with Ghezzi, the Examiner merely concluded that it would be obvious to use Doan's process to form Ghezzi's floating gate transistor. Unfortunately, such a conclusion does not provide a motive for making such a combination; and the Examiner's failure to articulate such a motive indicates that the *prima facie* burden for rejection has not been met. Moreover, Applicants contend that the burden cannot be met because there is no motivation to combine. The goal of Doan's invention is planarity; and the almost informal drawings of Ghezzi suggest that planarity is not an issue (*see* Ghezzi at FIGS. 2, 3, 4). In addition, the Examiner is unclear about what the Doan-modified Ghezzi transistor would look like (thereby further supporting the notion that *prima facie* burden for rejection has not been met), but presumably such a transistor would include Doan's film 40 somewhere between Ghezzi's silicon substrate 2 (the first material provided) and at least one of

Ghezzi's conductive gates 1, 5 (the last material addressed and pictured in Ghezzi). Applicants contend that any material other than the gate oxide located between Ghezzi's silicon substrate and one of Ghezzi's conductive gates would interfere with the operation of the transistor. As a result, one of ordinary skill in the art is discouraged from making the Examiner's proposed combination.

Thus the Examiner's misinterpretation of the references, combined with the Examiner's failure to provide a motivation to combine those references and Applicants' articulated motives against combination indicate that the *prima facie* burden for rejecting claims 60, as well as dependent claims 61, 63, and 64, has not been met.

Moreover, concerning claim 64, the Examiner further interpreted Doan as disclosing refraining from depositing a conductive material before depositing an insulative material. As mentioned above, Doan discloses so many options for its relevant layers that it allows for depositing a conductive material (such as tungsten, titanium, copper, or aluminum) before depositing an insulative material (such as tantalum oxide, silicon oxide, silicon nitride, or TEOS) and hence cannot be interpreted as disclosing refraining from such alternatives. (*See* Doan at col. 3, ln. 50 – col. 4, ln. 27.)

#### C. Rejection of claim based on Doan in combination with Van Der Scheer

The Examiner stated that dependent claim 62 was rejected in light of Doan, as applied to independent claim 60, in combination with Van Der Scheer (U.S. Patent No. 4,976,856). Applicants note that Doan alone was insufficient to reject claim 60. Rather, the Examiner required the addition of Ghezzi to form a basis for rejection. Thus, it is more accurate to say that claim 62 is rejected in light of Doan in combination with both Ghezzi and Van Der Scheer. As discussed above, however, the Doan-Ghezzi rejection suffers from (1) the Examiner's misinterpretation of the references; (2) a failure to articulate why one of ordinary skill in the art would be motivated to combine the references; and (3) indications that such an artisan would be discouraged from that combination. These problems carry through to the rejection of claim 62.

Moreover, such problems are exacerbated by the Examiner's attempt to add Van Der Scheer to the combination. In a manner similar to the rejection of claim 60, the Examiner merely concluded that it would be obvious to use Doan's process in order to carry out Van Der Scheer's

process. Unfortunately, the Examiner did not provide a motive for such a combination. This may be due to the fact that there is no such motive and, further, there are motives to avoid combination. Doan's process is directed to providing a planar surface. Van Der Scheer, on the other hand, is in no way concerned about the planarity of its workpiece. Specifically, Van Der Scheer indicates that its substrate may have "any suitable shape," including a tubular shape, and in fact prefers a tubular substrate because it can withstand high pressure differences. (Van Der Scheer at col. 4, ln. 15-32.) Moreover, inserting a layer such as Doan's layer 40 into Van Der Scheer's membrane layers risks affecting the selectivity or non-porosity of Van Der Scheer's device.

Similar compatibility issues exist between Ghezzi and Van Der Scheer. Ghezzi's focus is providing different dopant concentrations in a semiconductor substrate so that the gate oxide will grow thereon to different thicknesses. There is no indication as to how Van Der Scheer's process for forming a non-porous selective membrane would affect or be affected by such a process. As a result, one of ordinary skill in the art would be wary of combination.

Thus, given the untenable rejection of claim 62's independent claim, the lack of an articulated motivation to include Van Der Scheer as part of an obviousness rejection, and the articulated motives to avoid including Van Der Scheer in such a rejection, the rejection of claim 62 is untenable.

CONCLUSION

In light of the above remarks, Applicants submit that claims 52-64 are allowable over the applied references. Therefore, Applicants respectfully request reconsideration of the Examiner's rejections and further requests allowance of all of the pending claims. If there are any matters which may be resolved or clarified through a telephone interview, the Examiner is requested to contact Applicants' undersigned attorney at the number indicated.

Respectfully submitted,

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